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JOB # Final OUT REPORT

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State: Washington

Name: Don Pheasant Project Study

Project No.: W-70-B-C-10

Title: Hen Pheasant Harvest

Job No.: 4 Tr. (1)

Period Covered: July 1, 1969 through June 29, 1970

ABSTRACT

Hunting hen pheasants during the study period caused no adverse effect on pheasant numbers or production.

Hen pheasants represented only a small portion (9 to 18 percent) of the total pheasant harvest. An even smaller part of the overall hen population (6 to 12 percent) was removed by hunting.

After the conclusion of hunting, pheasant mortality continued. About three times as many birds were lost between the end of hunting season and the start of the breeding period as were taken during hen season. The hen season take, therefore, is considered to be conservative and well within safe limits.

Study of graphs of pheasant harvest shows a series of upward and downward trends. The study periods included a downward trend from the 1969 high. Taking hen had the effect of softening declines and stabilizing annual harvests at more than 550,000 birds.

Several counties in the northern half of eastern Washington showed declines greater than in the remainder of the state. This is attributed to environmental conditions, especially weather and declining habitat, peculiar to this region.

The overall impact of the hen seasons has been to increase hunter success.

During hen season years, it was determined that cock pheasant kill was increased approximately ten per cent by the increase in hunting pressure brought on by the hen season.

By comparing hunter questionnaire figures of 1969 through 1970, the percentage of decrease in the cock pheasant kill was determined. An anticipated hen kill was determined by merely calculating the percentage of cock kill from one year to the next. The anticipated cock kill was determined by adding ten per cent of the kill to the questionnaire figure (field checks show this increase during hen seasons).

It was determined that over 100,000 additional pheasants could have been taken in the 1969 season by hunters in 14 eastern Washington counties, 112,600 additional pheasants in 1969, and 108,300 pheasants in the 1970 season would have been added to the overall state pheasant harvests.

INTRODUCTION

The Washington Game Commission, in the summer of 1964, directed that a three-year study be conducted to determine the feasibility of hunting hen pheasants. The first open hen season since 1941 was subsequently adopted. The open hen area included prime habitats on irrigated farms, as well as less productive range on dryland wheat and cattle ranches. Hens could be legally taken only east of the Columbia River, north of the Snake River, and south of the Spokane River.

Seasons for taking hens were two weeks long and included the latter portion of the first "half" of the general pheasant season (earliest opening date was October 25 and latest closing November 14). Bag limits allowed one hen in the daily limit of three pheasants and three hens in the possession limit of twelve pheasants.

Field investigation of seasonal sex ratio variations, hunter bags, brood size, harem composition, crowing cocks, and plot densities was intensified. This information supplemented kill data from the annual five per cent sample of license holders.

DISCUSSION

History of Pheasant Harvest (1947-1970): The background of fluctuation in pheasant numbers and take is essential to an analysis of the relatively short three-year study of hen harvest considered here. Figures 1 through 6 clearly illustrate the increases and declines which have occurred; they also suggest that similar "good," "bad," and "mediocre" years are likely in the future. District and state graphs, in general, show trends are similar. (To depict the effects of the limited hen harvest on district pheasant kills and relate this to the long-term trend, hen portions of the total kill were charted. Where no hen season was held, a kill comparable to that taken in areas of similar habitat was computed and appears as a dotted addition to the actual kill.)

There are exceptions, however, which may be attributed to habitat quality or other environmental aspects. The Columbia Basin District (Figure 1) shows a continuing upward trend; this is a reflection of habitat improvement directly associated with development of the Columbia Basin Irrigation Project. A similar response to irrigation occurred earlier in the Yakima District (Figure 2); recent agricultural patterns, however, have tended to destroy habitat and depress pheasant production and harvest.

Periodic low point, including the current one, in Spokane District (Figure 3) reflects two things: (1) the marginal nature of much of the habitat, and (2) the depressing effect of periodic adverse weather conditions, as experienced in the winters of 1964-65 and 1968-69, in that corner of the state. A pattern similar to this is apparent in Wenatchee District (Figure 6). Counties involved (Chelan, Douglas and Okanogan) are in the northern half of eastern Washington and subjected to weather and habitat vagaries comparable to those in Spokane and Lincoln Counties. Further evidence of these phenomena may be seen in the graph for Stevens, Pend Oreille, and Ferry Counties included in the appendix.

Walla Walla District (Figure 4) shows the greatest stability; deviations from the average are minimal and reflect relatively constant environment.

In the Columbia Basin District (Figure 1), it is demonstrated that hens contributed an increment to what otherwise would have been a decline from the 1963 peak. A below-average kill would have resulted in Spokane District (Figure 3) had hens not been shot. The state trend (Figure 5) would have shown a much deeper trough without the added hens.

Computed kills show that if a comparable number of hens had been taken in closed areas, a boost would have been given to total kills. Figure 2 shows that the Yakima District kill would have been comfortably above its average instead of being below for two of the three study years. Near-record kills would have occurred in Walla Walla District (Figure 4) in the latter two years.

Adding actual and computed hen kills to the traditional cock-only statewide figures (Figure 5) show that only a minor decline would have occurred and the record 1963 kill would have been approached in 1966.

Similar observations can be made by comparing graphs of individual counties included in the appendix. Of special interest is the impact of the decline in Spokane County, which caused the district trend to be altered downward. A direct comparison of the state's major pheasant producers (Grant and Yakima Counties) is also shown.

Perhaps the greatest significance gained in study of individual county graphs is depicted in trends in some counties which are contrary to the statewide trend. These reflect subtle environmental conditions peculiar to areas of like habitat.

Composition of Pheasant Kill: The conservative hen season length and bag limits provided a significant increment to the total pheasant take. For the three years, 144,650 hens were taken. Of these, 74 per cent were from irrigated and 26 per cent was from dryland counties. The average annual kill was 48,526 hens. This harvest was of a magnitude which almost equaled the annual take of cock pheasants in Districts Three and Five combined.

During the study, the highest percentage of hens in the total kill was taken in Franklin County--18 per cent (Figure 7). The lowest was 9 per cent in Lincoln County. Irrigated counties had a harvest of hens greater than those in dryland areas--15 per cent compared with 13 per cent.

These data may also be expressed in terms of cocks taken for each hen killed. In Franklin County, almost five cocks were taken for each hen, while in Lincoln County there were almost ten for each hen. Others were as follows: Douglas was nine to one; Spokane and Whitman both had six to one; and the dryland average was six and one-half to one.

Of significance are data from field checks, which show two things: (1) cock harvest was stimulated during the hen season, and (2) sex ratio of pheasants bagged during the hen season was 1:1. No definite figures are available, but it is apparent total pheasant kills were enhanced during the portion of the general season that was open to hens.

Percentage of Hen Populations Harvested: Of primary concern to the Game Commission was the effect taking hens would have on subsequent production. Figure 8 shows the percentage of hens taken in Franklin County; the lowest, six per cent, in Lincoln County. About 12 per cent of the hens in irrigated counties were harvested while dryland areas yielded 9 per cent of their hens. These data were derived by comparing pre- and post-season sex ratios and computing percentage of kills taken from total pheasant populations.

The percentage of birds taken from hen populations is very far below the percentage of cocks taken. In heavily hunted parts of the state, 80 per cent or more of the cocks fall to the gun. Less popular sites may yield 60 per cent or fewer of the available roosters. Though it is obvious hens are to be hunted less intensively, a take of less than 15 per cent of the population is very conservative. The determination of a safe level of hen harvest is an important consideration in this study and is discussed below.

Hen Losses and Population Changes: Changes in hen numbers from pre-hunting season levels to those available going into the breeding season are illustrated in Figure 9. Kill data for counties in the open hen areas served as the basis for computations. Cock populations were projected from kill figures; sex ratios provided factors used in determining percentage of total cocks killed (80 percent--irrigated; 67 per cent--dryland). Hen-to-cock ratios were used to establish pre-season hen numbers (16:1.25?). Broodstock levels were based on spring sex ratios (18:38--irrigated; 18:29--dryland).

The essential information presented in Figure 9 is that the take of hens has been well within safe limits. The removal of up to 11 per cent of the hens by hunting is far below the 33 per cent which is lost between the end of the season and start of the breeding period. Doubling the legal take to 22 per cent would indicate that about half of the post-hunting season loss would appear in the hunter's bag. A margin of 22 per cent would still remain, although a loss of the same magnitude would still occur before breeding season.

Analysis of 1967 Hen Season and 1968 Through 1970 Cock-Only Harvest in the Irrigated and Dryland Areas of Eastern Washington: Kill data from the 1968-70 seasons were compared with 1967 data from irrigated areas and dryland areas that had hen seasons. Percentage decline in kill was calculated for these areas. The potential kill, had there been a hen season, was calculated by including an additional harvest of a magnitude experienced in previous hen seasons.

DISCUSSION

The 1968-70 pheasant hunting seasons were approximately the same length as those of the past five years, but for the first time since 1963 there was no hen season.

Cock kill in the irrigated Columbia Basin in 1968 was down 11 per cent from the cock kill of 1967. Figures indicated during the previous four years that there was a 10 per cent increase in cock kill resulting from additional hunting pressure because of the hen season. Based on these data, 1968 cock kill in the area would have been down only 1 per cent (2,025 cocks) from the 1967 kill if a two-week hen season had been established. The 1968 hen kill in this same area was calculated by reducing the average hen kill by 11 per cent, equal to the 1968 decline in cocks from 1967. The 1968 hen take in the Basin, consequently, would have been approximately 35,320 birds.

In the dryland areas of eastern Washington, where there had been a hen season in 1967, the 1968 cock kill was down 22 per cent. Again, calculating an increased cock kill of 10 per cent because of added hunting pressure resulting from a hen season, the cock kill would have been down only 12 per cent (6,820). Total 1968 cock kill would have been 65,030 instead of 57,210. Figure 1 shows the 1968 projected pheasant kill had there been a two-week hen season.

In the dryland hen area, hen kill would have been 8,040 (based on a hen kill equal to the 22 per cent reduction in cocks).

In the Irrigated Yakima Valley (Irrigated Control), questionnaire data showed the cock kill to be down seven per cent in 1968. This is about the same as the decrease in cock kill in the Basin.

Had there been a two-week hen season in the Yakima Valley, a three per cent increase in the cock kill would have been expected. This is based on a ten per cent increase resulting from increased hunting pressure and a seven per cent decrease in the 1968 cock kill. Based on these data, the 1968 Yakima cock kill, with a hen season, would have been 124,170 cock pheasants instead of the 111,870 cocks killed with no hen season.

Data from the Columbia Basin were used in calculating the projected hen kill for the Yakima area, which has had no hen season experience. Fifteen per cent of the total kill in the irrigated basin has been hens.

Fifteen per cent of Yakima's 1968 cock kill of 124,170 is 18,620 birds, and represents the approximate number of hens which would have been taken.

In the Walla Walla area (Dryland control), 1968 cock kill was down 32 per cent. Had there been a hen season, cock kill would have been down 22 per cent from 1967. Thus, the cock kill would have been 33,850 birds.

By applying the same hen-to-cock ratio in the kill as in the dryland hen area, the hen kill for the Walla Walla area can be determined. About 12 per cent of the kill in the dryland counties is hens during a season including legal hen hunting. The calculated hen kill, therefore, would have been 4,060 birds.

The projected cock kill was calculated by adding the number of additional cocks which accrue in the total bag during an open hen season. Primary factor is stimulated hunting pressure.

The above procedure was used in projecting the additional harvest had there been a hen season in the period 1969 and 1970.

Figure 10 - 1968 ACTUAL AND PROJECTED PHEASANT KILLS IN FOUR AREAS OF EASTERN WASH.*

Area	Actual Cock Kill	Projected Cock Kill	Legal Hen Kill	Projected Hen Kill
Irrigated Hen	180,680	200,500	--	33,320
Dryland Hen	57,210	64,670	--	8,040
Irrigated Control	111,870	124,170	--	18,620
Dryland Control	29,330	33,850	--	4,060
TOTALS	379,090	423,190	--	64,040

*The projected cock kill calculated resulted from a hen season in all four areas listed in the table.

1969 ACTUAL AND PROJECTED PHEASANT KILLS IN FOUR AREAS OF EASTERN WASH.

Area	Actual Cock Kill	Projected Cock Kill	Legal Hen Kill	Projected Hen Kill
Irrigated Hen	188,480	207,328	--	36,000
Dryland Hen	45,680	50,248	--	12,000
Irrigated Control	123,770	136,147	--	20,422
Dryland Control	36,390	40,029	--	4,803
TOTALS	391,320	433,752	--	73,225

1970 ACTUAL AND PROJECTED PHEASANT KILLS IN FOUR AREAS OF WESTERN WASH.

Area	Actual Cock Kill	Projected Cock Kill	Legal Hen Kill	Projected Hen Kill
Irrigated Hen	189,550	208,505	--	36,000
Dryland Hen	55,710	61,281	--	12,000
Irrigated Control	106,693	117,359	--	17,603
Dryland Control	32,210	35,431	--	4,251
TOTALS	381,160	422,576	--	69,854

Sex Ratio Comparison: Sex ratio counts, taken from January through April each year, in all eastern Washington areas show no appreciable change in the hen-to-cock ratios in irrigated and dryland habitats. In irrigated habitats, the cock-hen ratio has consistently held at about 1:3. The cock-hen ratios in dryland habitats are much closer (1:1.5 to 1:2) in April. These more arid areas have relatively low hunting pressure and light cock kills. In several years (1969 included), April counts showed ratios higher to hens in Region One (open to hens) than in Region Three (closed to hens).

Sex ratio counts, in all instances, show no perceptible change in the cock-hen ratio at the start of the brood season, whether there had or had not been a hen season the previous fall.

CONCLUSIONS

1. The long-term pattern of fluctuations in pheasant kills continued during the study period.
2. Increases or decreases in individual counties reflected habitat quality and other environmental factors.
3. A total of 1,4650 hens were taken during the three-year study period (1964-1966). The hen take comprised 15 per cent of the total pheasant kill in the open irrigated counties, and 13 per cent of those taken in open dryland counties.
4. A low percentage (11 per cent or less) of the total hen population was taken during the legal hen season.

5. A substantial loss (33 per cent or more) occurred in hen populations after the close of the legal hen season.
6. Hunting hens stimulated cock harvests. Had there been a hen season in the years 1968, 1969, and 1970, there would have been an increase in the overall harvest for this period of over 320,900 additional pheasants taken, consisting of 113,781 additional cocks and 207,119 hens.
7. Hens added to cock harvest acted to moderate the downward trend in dryland areas and continue an upward trend in irrigated counties.
8. Regulations during the period of hen seasons kept the harvest well within safe limits and caused no adverse effect on hen populations.

RECOMMENDATIONS

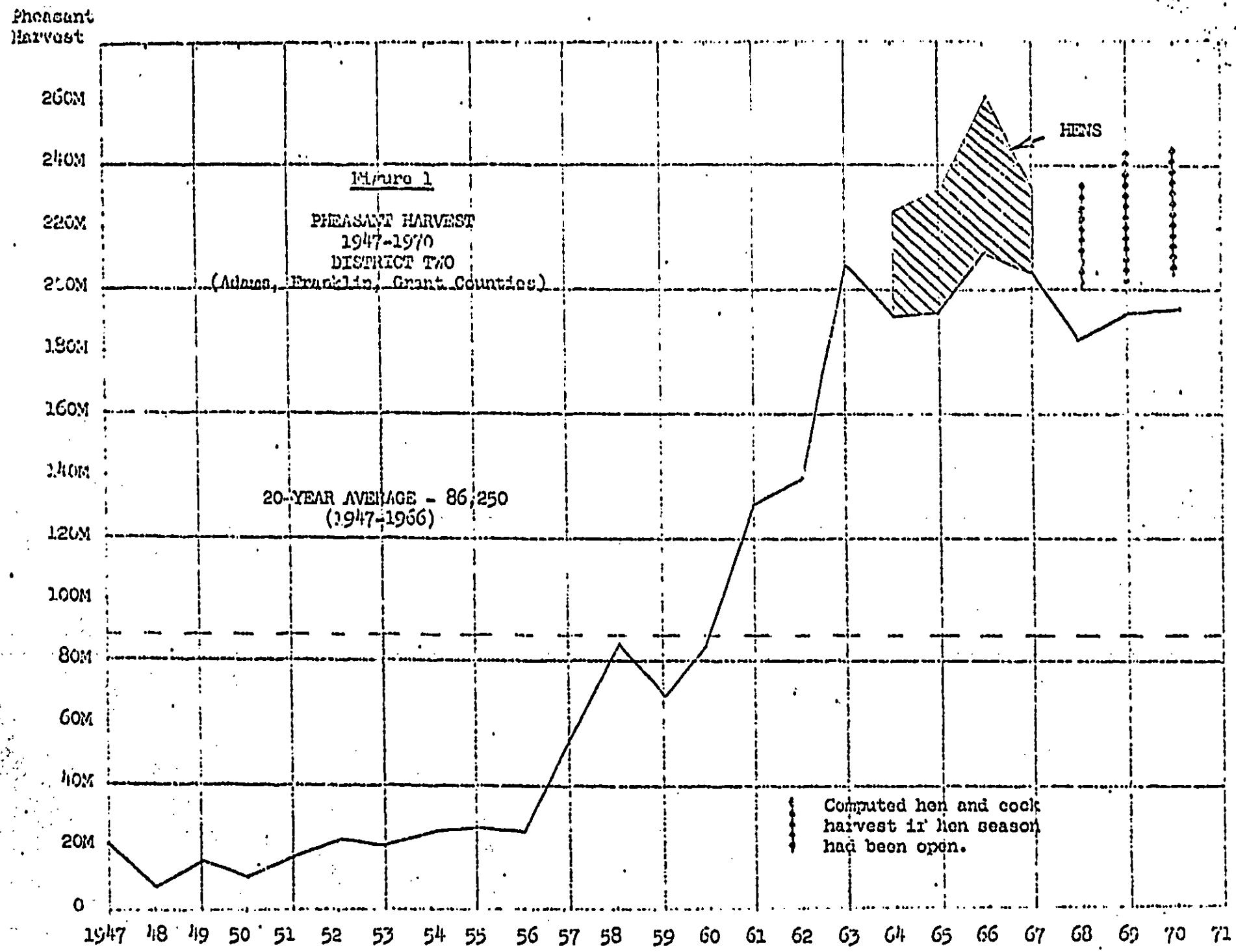
1. Recommendations should be made on region or area basis dependent upon population and production status.
2. Consideration should be given in setting future hen seasons to areas including Walla Walla and Yakima counties.
3. Regions or areas including large tracts of marginal habitat, such as the Spokane area, should be excluded from consideration for future hen seasons.

Principal Investigators

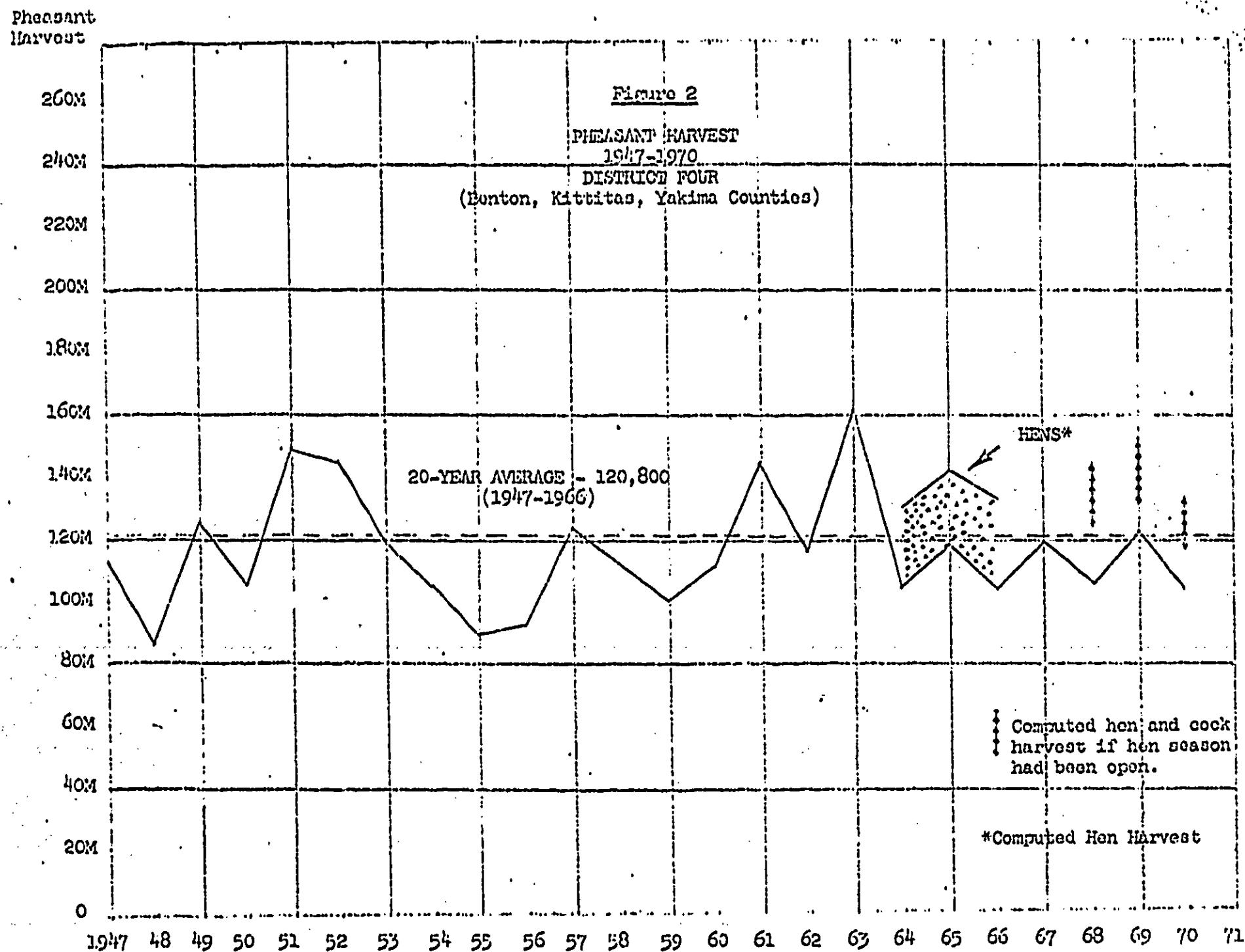
Prepared by: Don Galbreath, Regional Biologist
 Jack Adkins, Regional Biologist
 E. S. Dziedzic, Game Management Staff

Approved by:

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Pheasant
Harvest

Figure 3

PHEASANT HARVEST

1947-1970

DISTRICT ONE

(Lincoln, Spokane, Whitman Counties)

260M

240M

220M

200M

180M

160M

140M

120M

100M

80M

60M

40M

20M

0

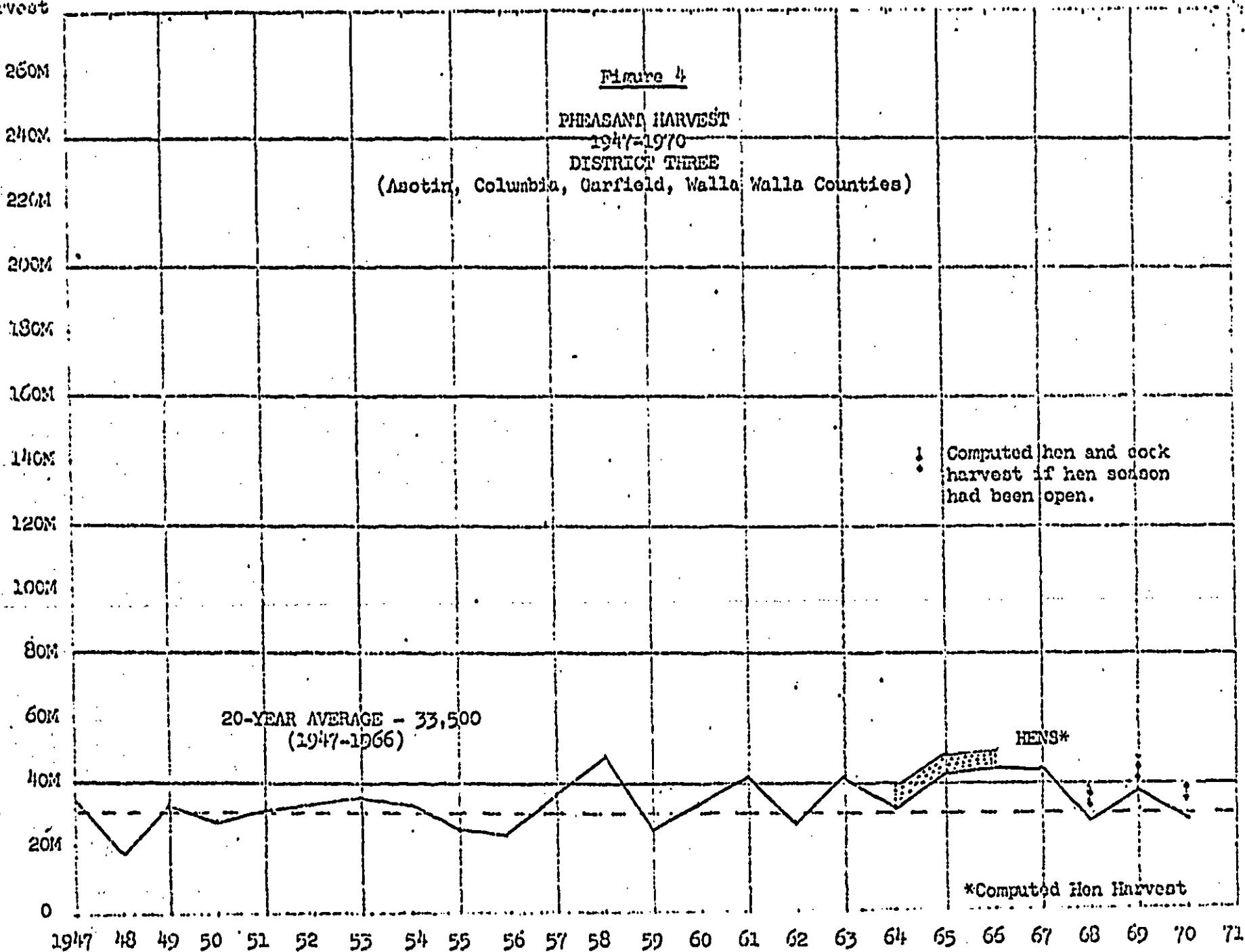
20-YEAR AVERAGE - 70,200
(1947-1966)

HENS

Computed hen and cock
harvest if hen season
had been open.

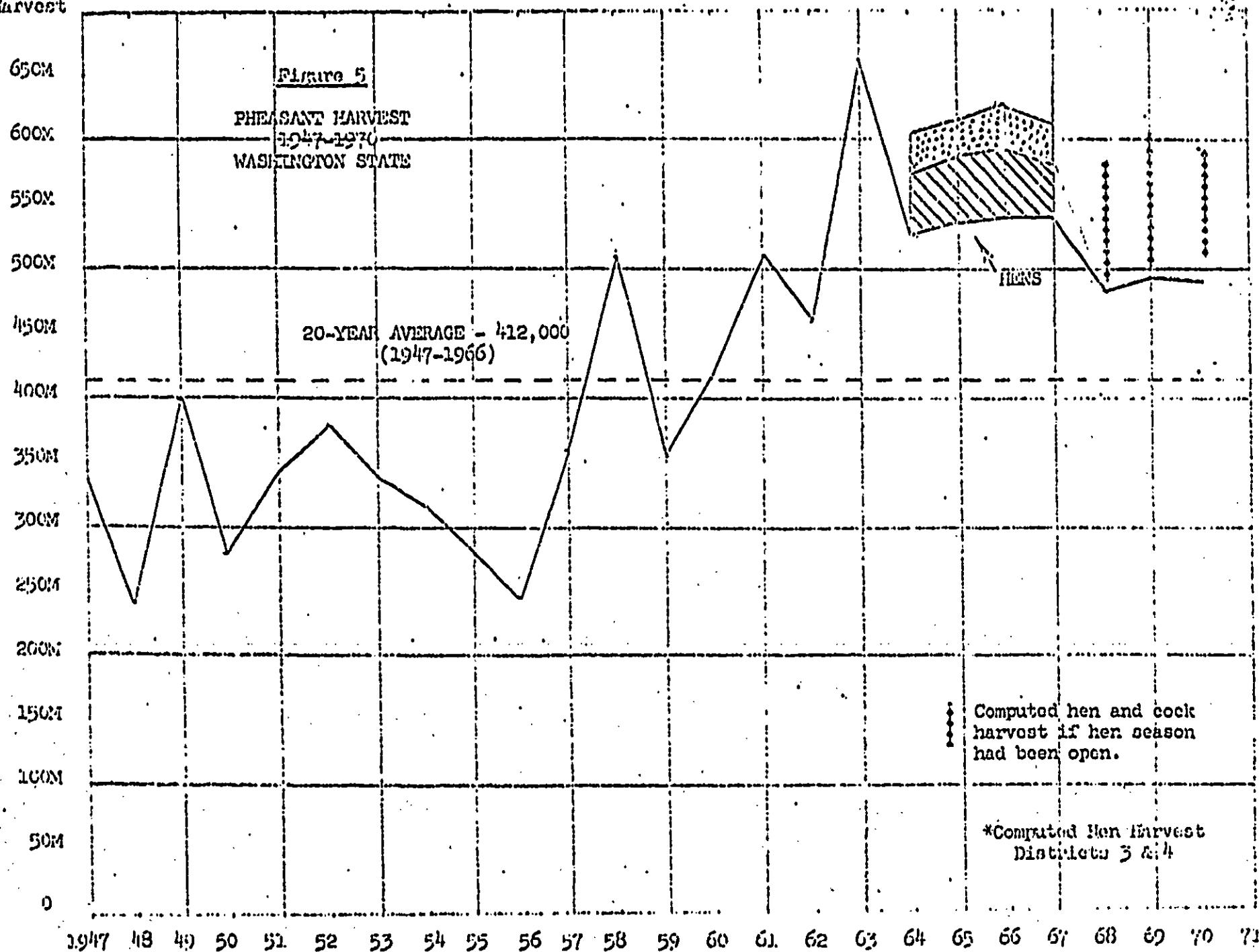
1947 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71

Pheasant
Harvest



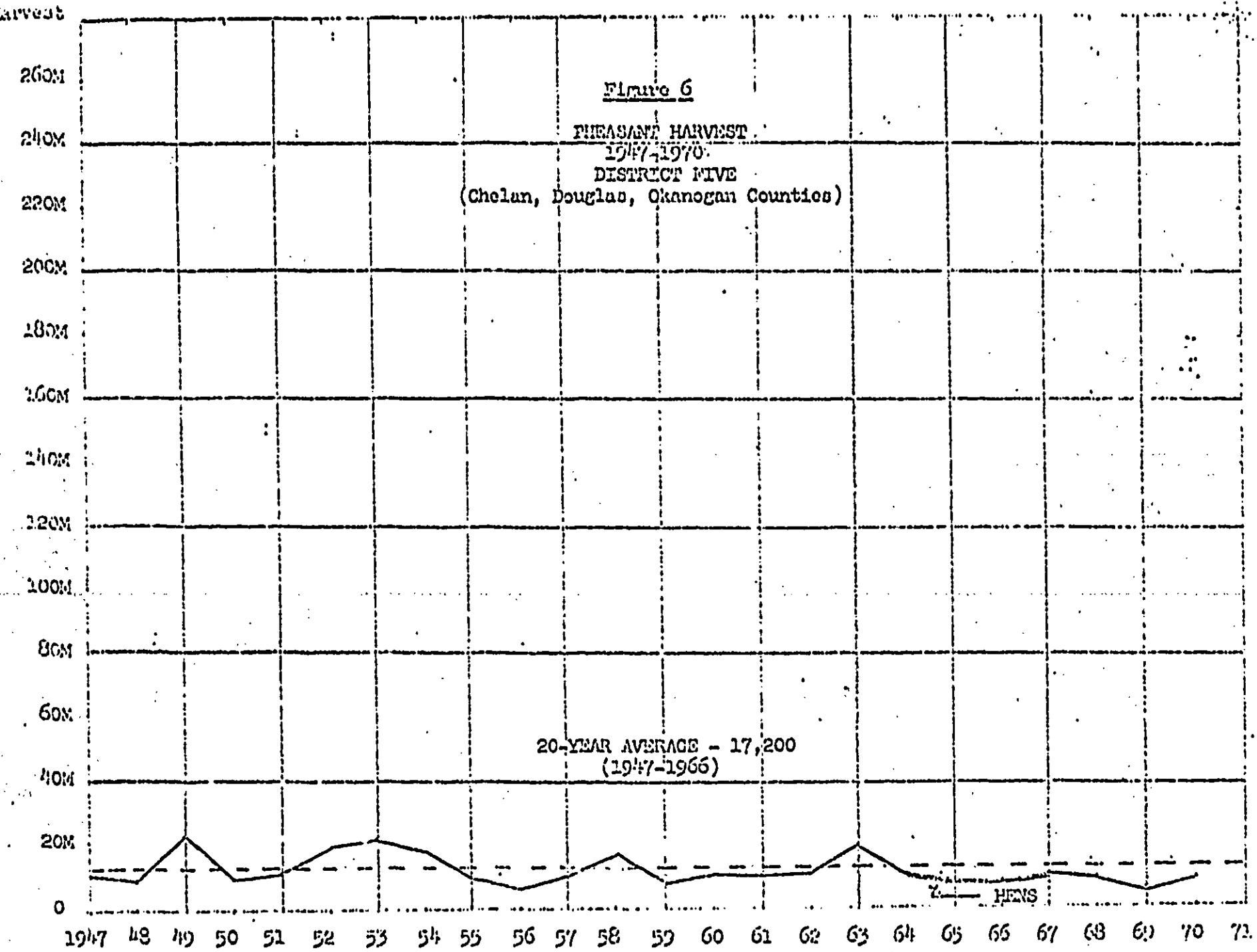
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Pheasant
Harvest



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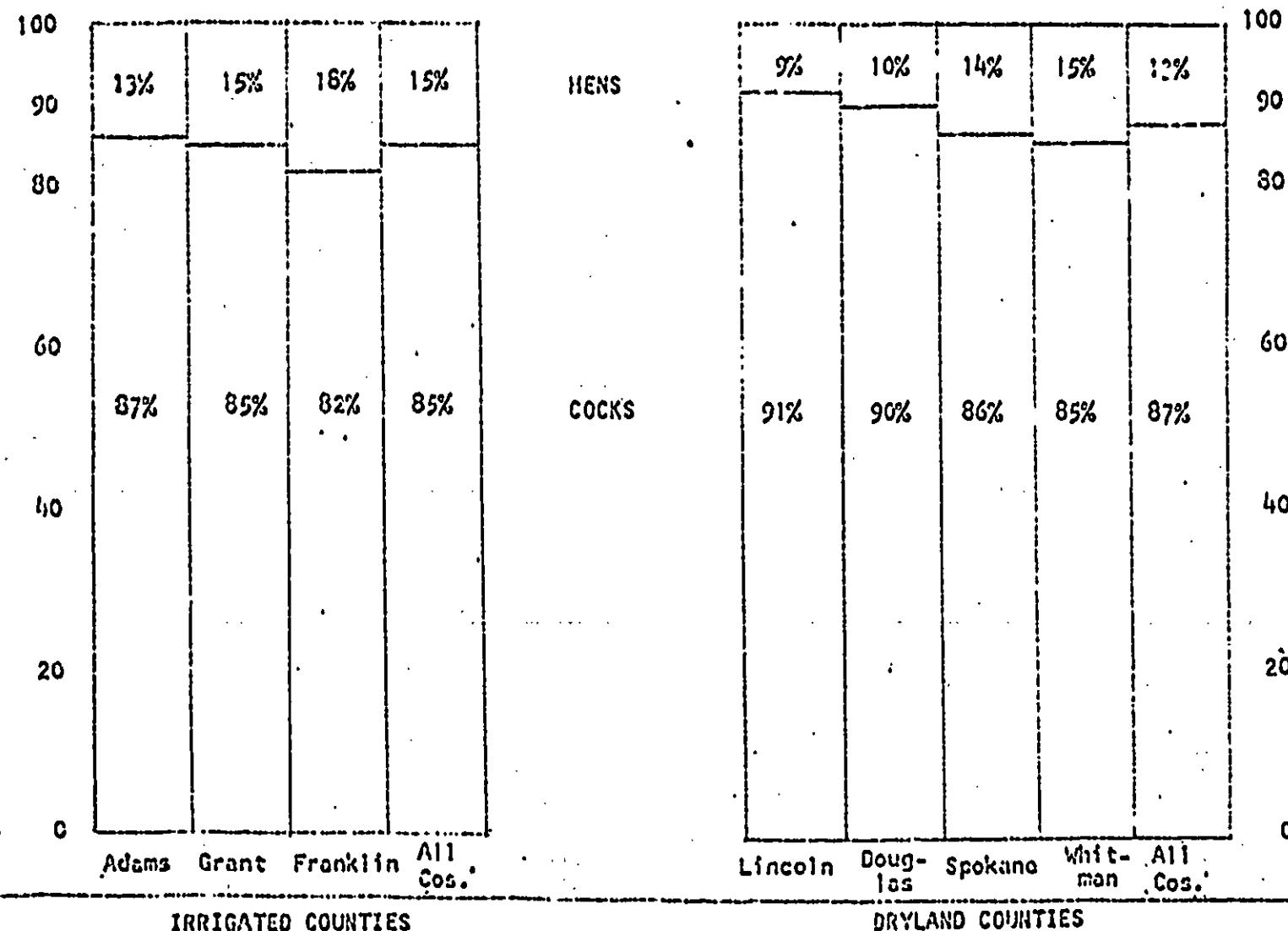
Pheasant
Harvest



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Figure 7

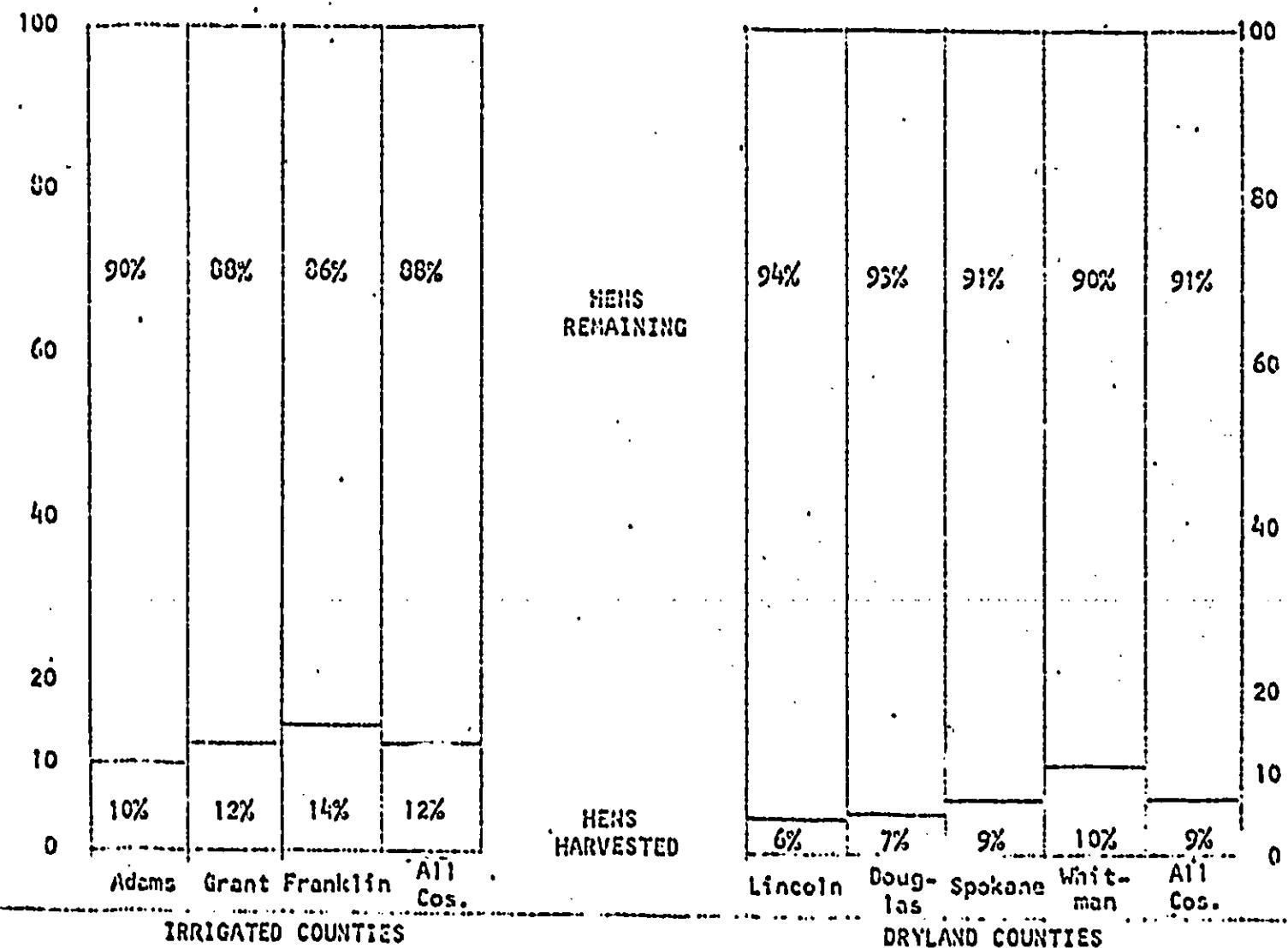
COMPOSITION OF PHEASANT KILL
IN COUNTIES OPEN TO HENS DURING THREE-YEAR STUDY



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Figure 8

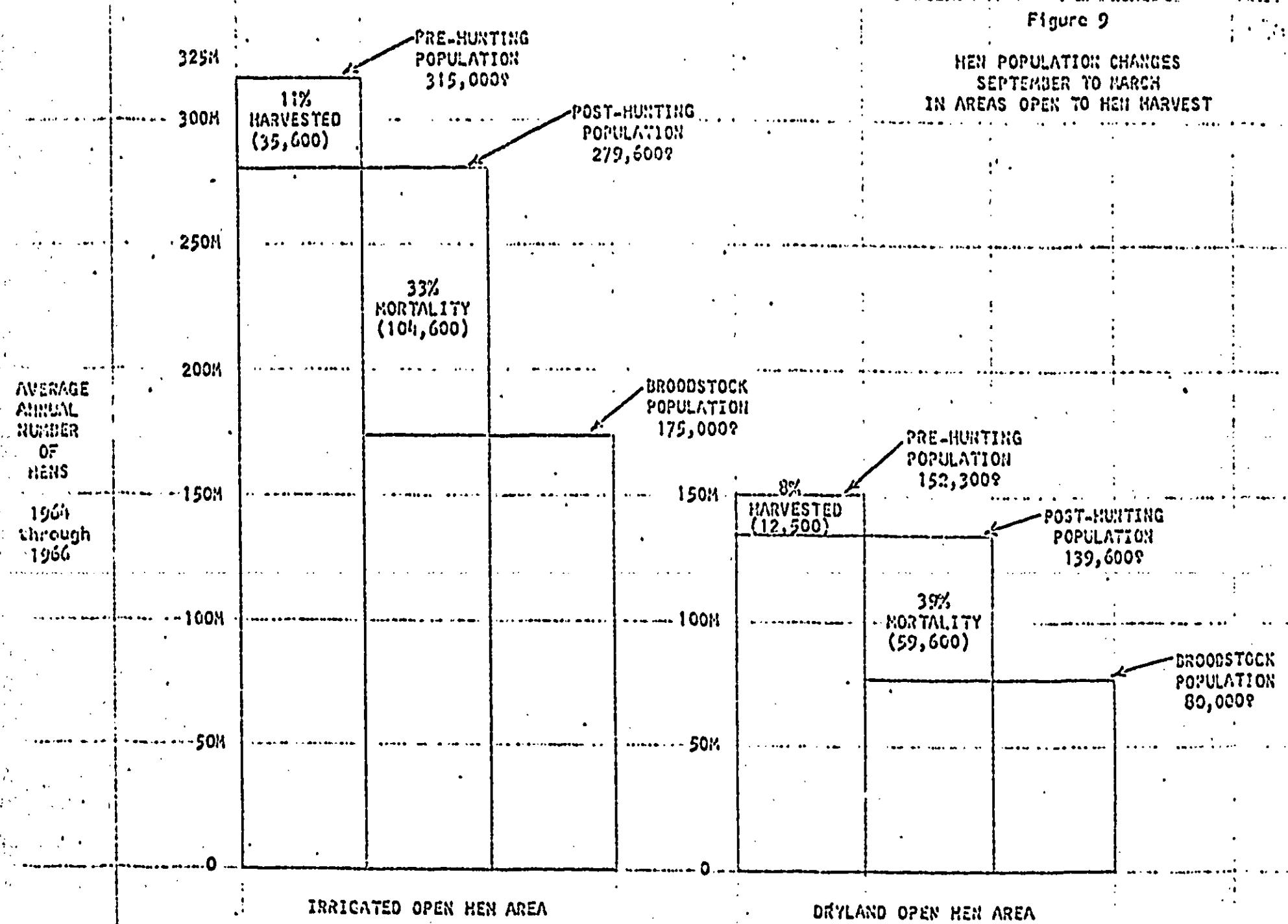
PERCENTAGE HEN POPULATIONS HARVESTED IN COUNTIES OPEN TO HENS DURING THREE-YEAR STUDY



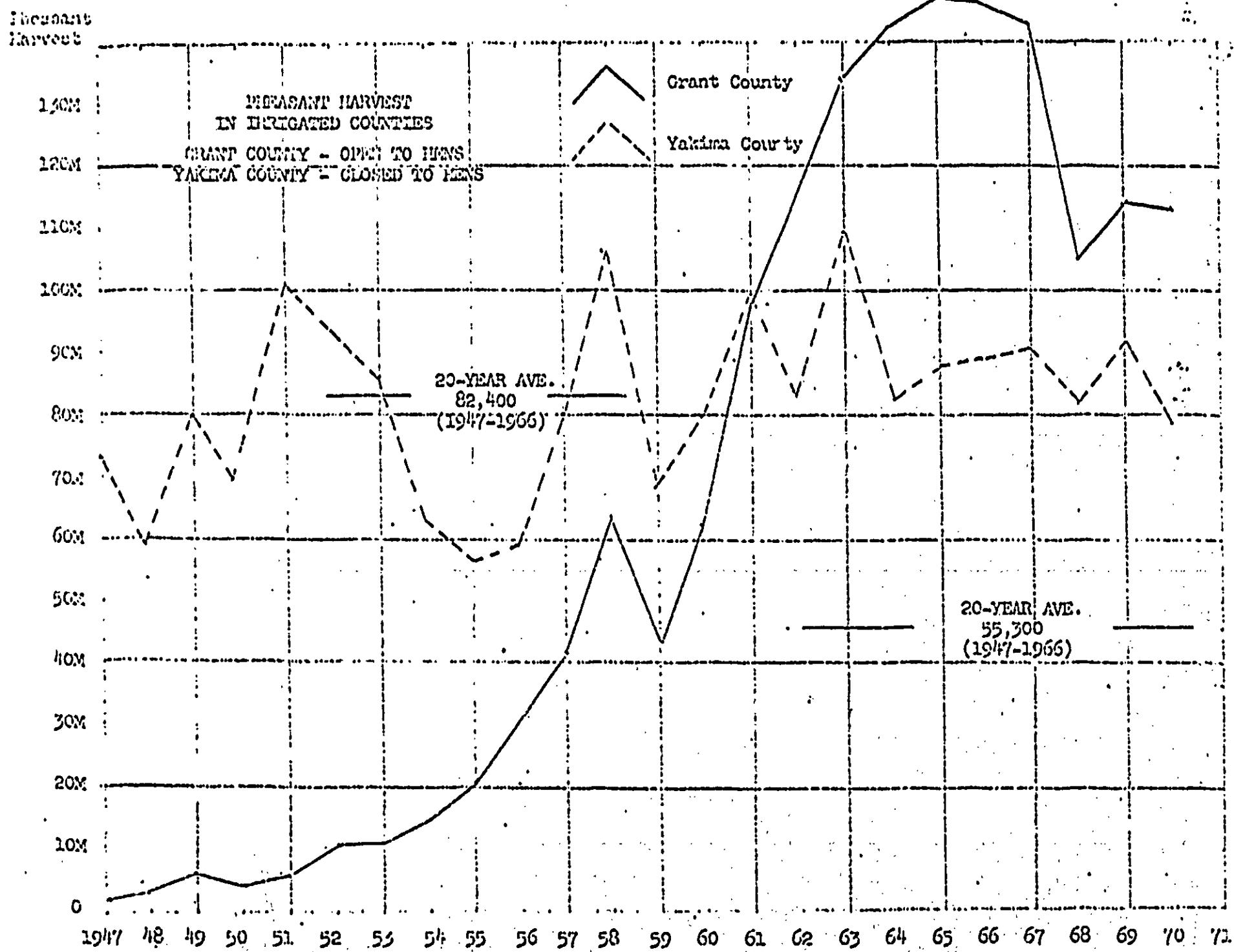
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Figure 9

HEN POPULATION CHANGES
SEPTEMBER TO MARCH
IN AREAS OPEN TO HEN HARVEST

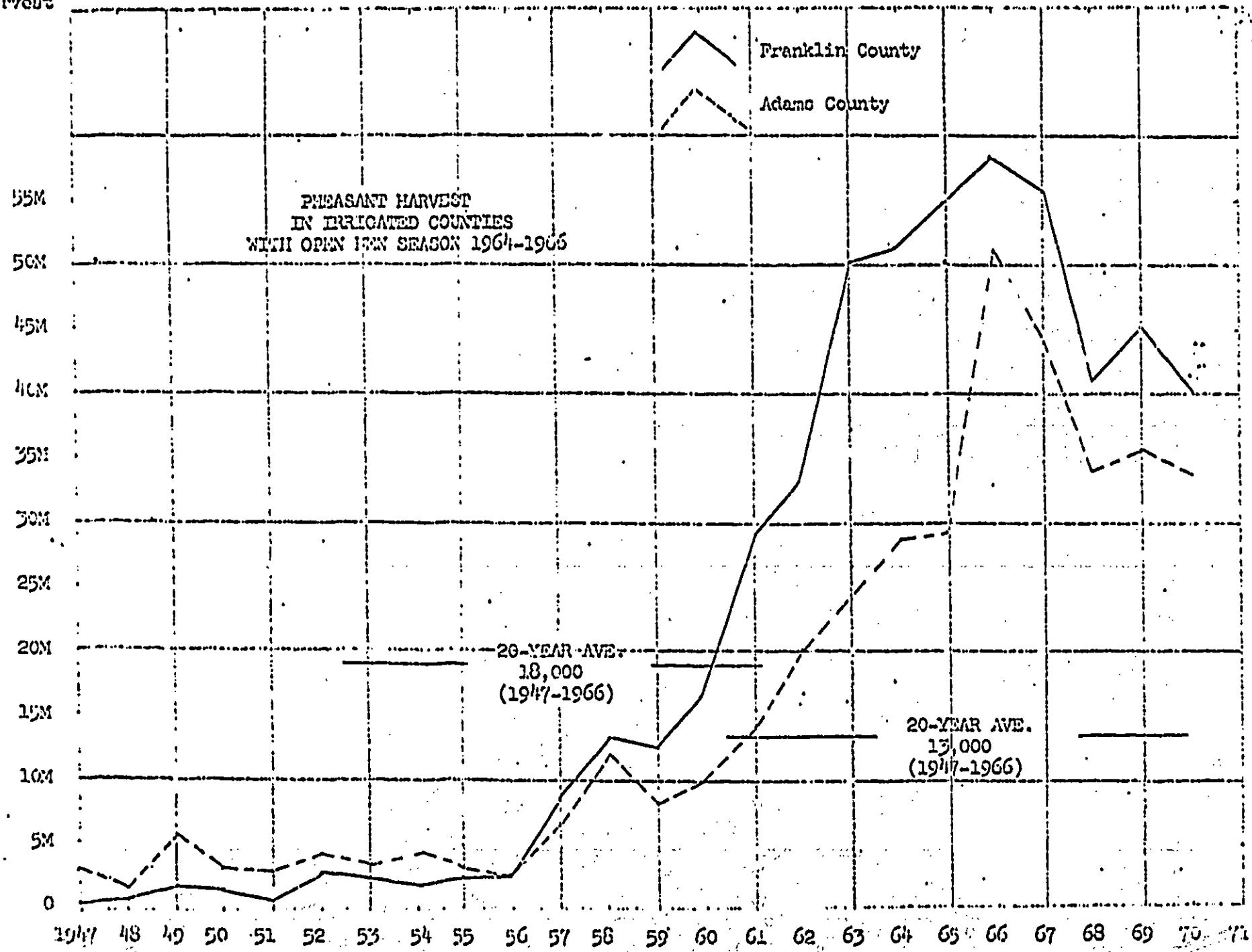


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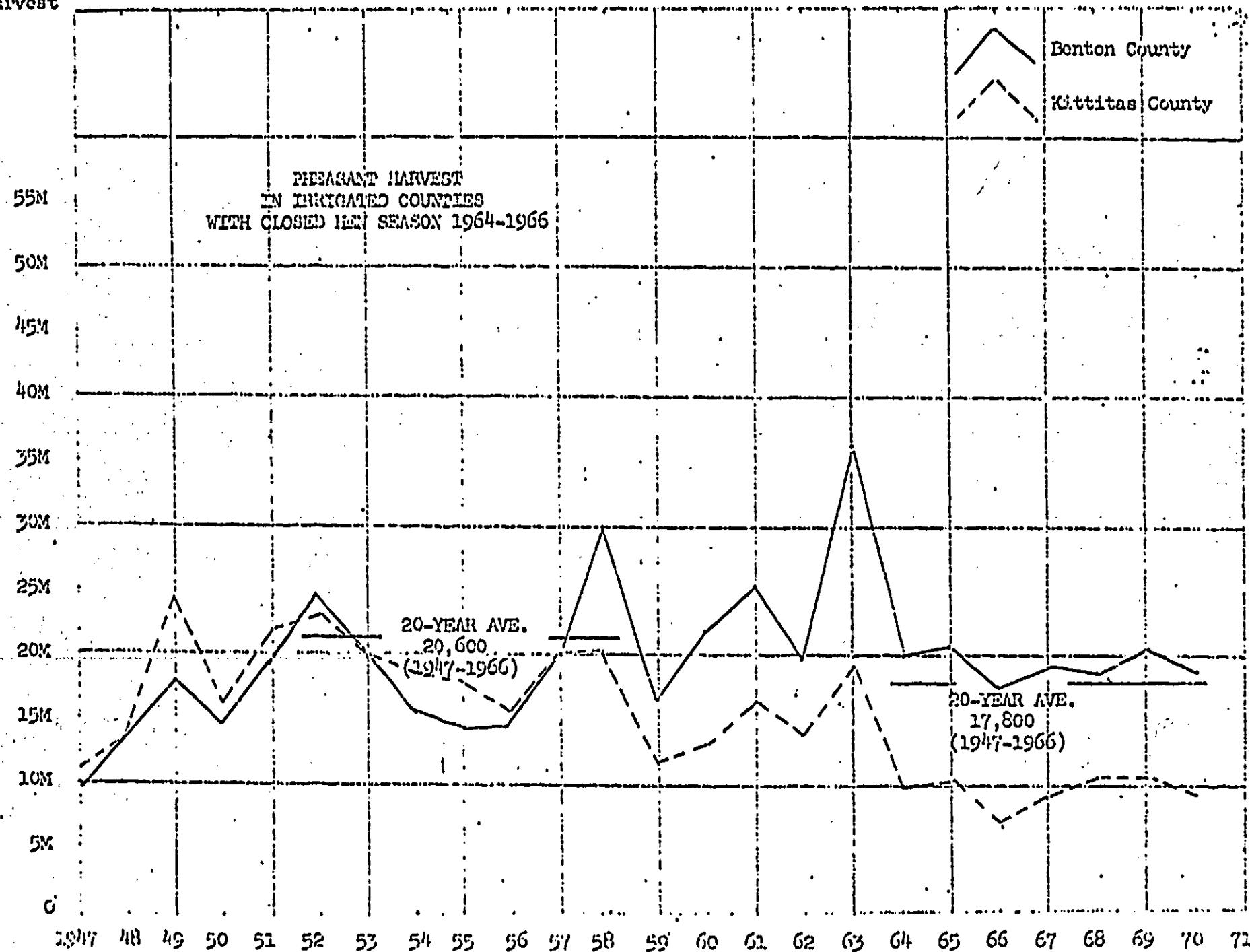
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Pheasant
Harvest



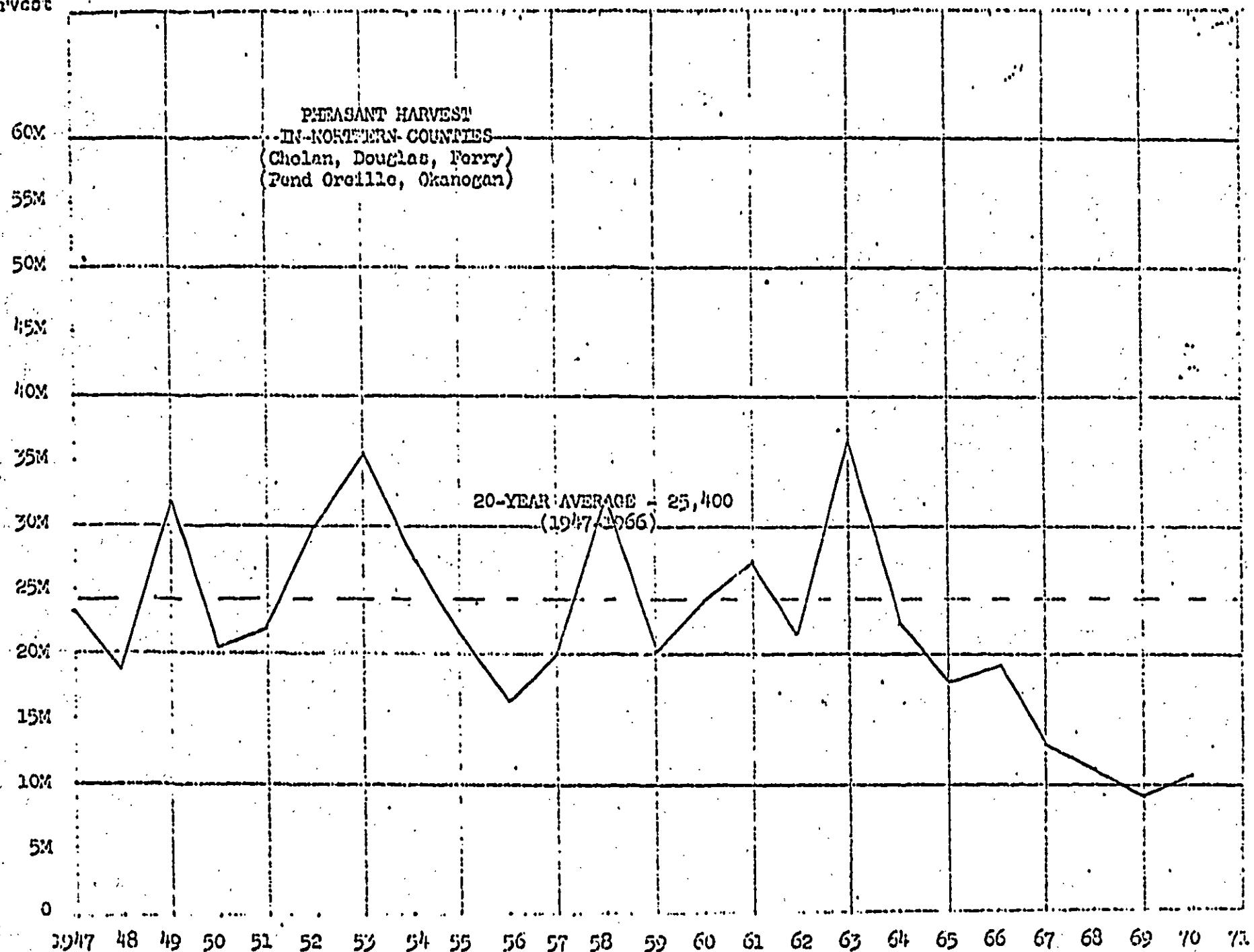
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Pheasant
Harvest



POOR COPY

Pheasant
Harvest



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Pheasant
Harvest

PHEASANT HARVEST
IN DIXIE COUNTIES
WITH OPEN HEN SEASON 1947-1966

Whitman County
Spokane County

55M

50M

45M

40M

35M

30M

25M

20M

15M

10M

5M

0

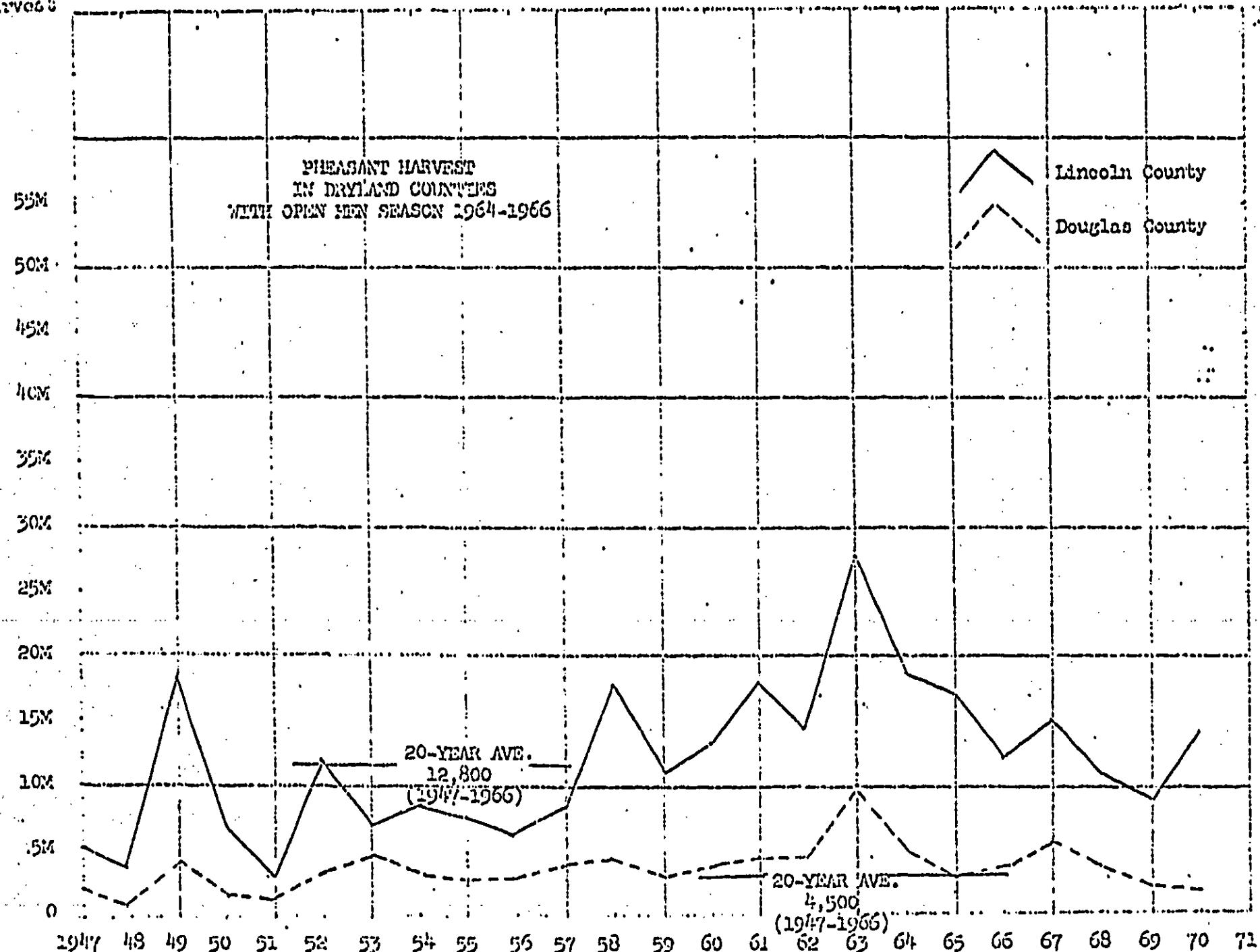
20-YEAR AVE.
39,000
(1947-1966)

20-YEAR AVE.
18,300
(1947-1966)

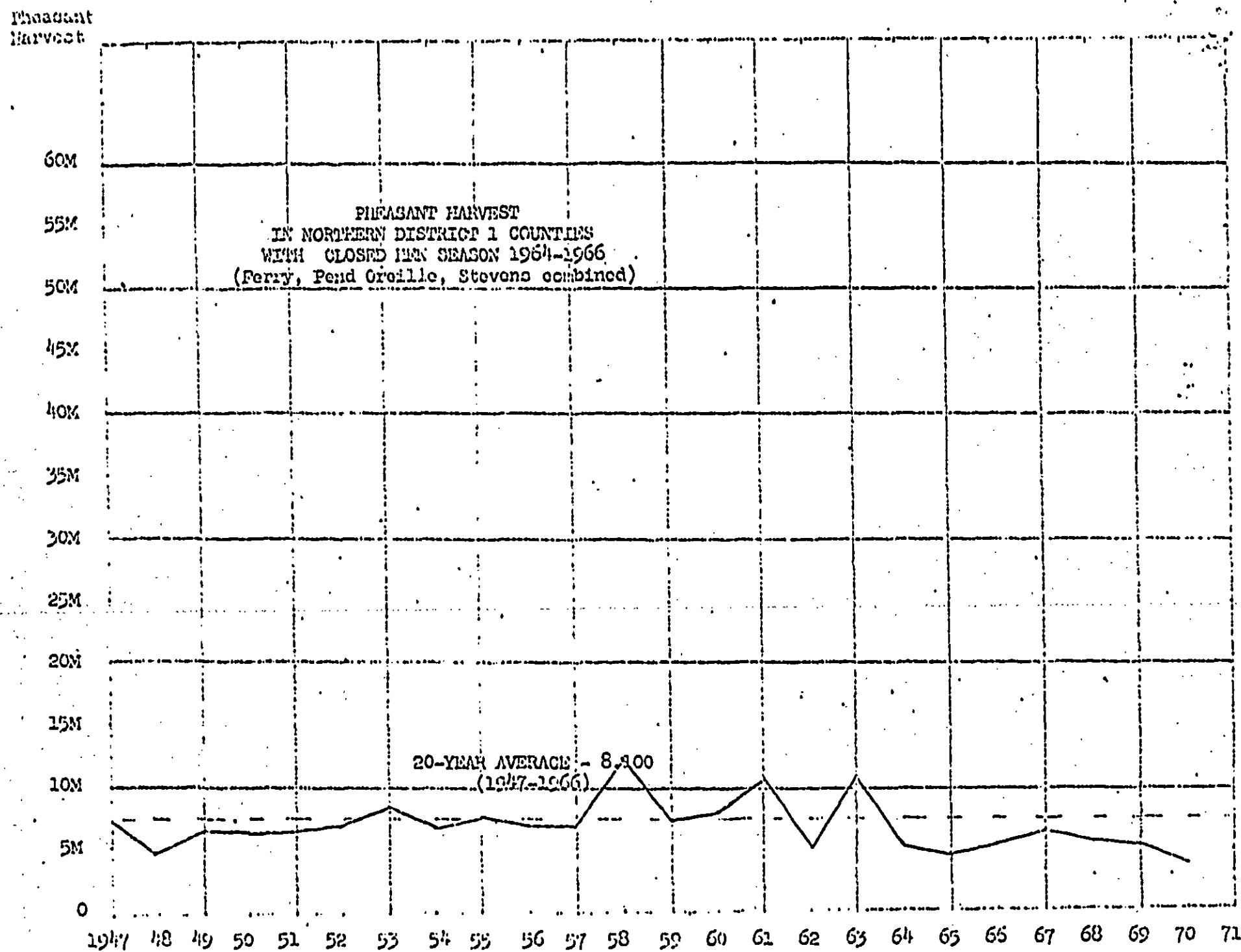
1947 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71

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Pheasant
Harvest



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Pheasant
Harvest

